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ABSTRACT

Employing an English-as-a-second-language approach, Gallaudet College has developed 101 computer assisted instruction (CAI) lessons to help deaf students master basic English structures. These lessons begin with a pretest and then branch to appropriate explanations and drills. Some are accompanied by coordinated presentations in sign language. In the future, CAI lessons will be introduced into the regular curriculum with emphasis on language skills, reading, and remediation. (EMH)

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THE USE OF C.A.I. IN THE LANGUAGE PROGRAM AT GALLAUDET

By: James L. Madachy &
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We have created and stored in Gallaudet's DEC PDP 11 computer a series of 101 C.A.I. lessons. These lessons are used in conjunction with Gallaudet's Language Program (250 students) and with adult Continuing Education classes. These lessons are based on an English as a second language format. We used the second language format because we believe that our student's first language is sign, and that English is comparable to a foreign language for them. This aspect makes our lessons unique in that they were designed and written expressly for use by deaf students.

We now have sixty core lessons dealing with basic English structures. Each of these lessons includes a pre-test, an explanatory section, and a drill and practice section with branching and further explanation for erroreous responses. If a student passes the pre-test, he does not see the rest of the lesson since he has demonstrated mastery of the material presented. If he does not pass the pre-test, he is branched to the explanatory and drill and practice sections of the lesson. In the drill and practice sections, we offer hints and further explanation for both specific errors that we have identified, and for general errors that we expect. These are designed to lead the student toward the correct response rather than just giving him the right answer. The student can often have up to four or five chances to type in the correct response. The core lessons are designed for mastery. Less than two mistakes (other than typing errors) should prove mastery.

In addition to the core lessons, we have ten reviews of material presented in the core lessons. These reviews offer but a few hints and permit only two chances to respond. We also have ten tests of material presented in the core lessons. These permit only one attempt per question.

To respond to what are sometimes called "deaf" errors in usage or to areas we have determined to be especially needed with our student population, we also have twenty lessons on areas such as the use of articles, prefixes and suffixes, and idiomatic verb phrases; each with cumulative tests. We have eight vocabulary lessons and seven other vocabulary lessons that are coordinated with video tape presentations in American Sign Language and Signed English. These lessons do not include pre-tests because their content is such that

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we want all students to work through the entire lesson.

We are utilizing a user's program called Gnosis to create the lessons and inputting and editing the lessons by means of Teco. Gnosis was developed in Sweden and has most of the capabilities that we require. It is quickly learned and uses English as its language. It is translated into its computer language (ALGOL) and then loaded and saved for student access. Teco is an extremely powerful editing language which fills all our needs for input. The Gnosis program provides for an automatic printout of student errors. Our teachers then use these printouts to determine each student's needs. We also use these printouts to improve the lessons themselves.

Our software also includes programs to control easy student access, semi-automatic logoff, and security measures. The student needs only to LOGIN with one project number; no password is needed. Then the computer asks which lesson he wants. He responds with a one to three digit number, and the rest of the lesson is computer controlled. At the end of each lesson, he is asked if he wants another lesson and can type in another number. If he wishes to stop, he can type in BYE, and he is automatically logged off, and his error information is printed.

The lessons can only be accessed from specified terminals to prevent cheating. The lessons can be practiced as often as the student or teacher wishes, but the tests can only be accessed with a teacher's permission. The tests require a password (which is periodically changed) that only the teachers know, plus a different project number is used. If an error is made in attempting to access a test, the lesson is automatically logged off. The test master program does not permit another test or lesson upon completion of the current file. An instructor must log the student on each time a test is desired.

One of our main objectives is to integrate C.A.I. into the total Language Program at Gallaudet. This objective reflects itself in the design of our student access areas, which form an important component in the spatial arrangement of our program.

The spatial arrangement of our Language Program consists of four primary units which are nearly identical in design (see enclosed drawing). Each primary unit consists of three smaller areas separated by portable partitions. The areas within each primary unit are these: an office area for teachers, a classroom area, a student work area. The computer terminals are located in the student work area of each unit, each unit having either two or three

terminals. We have a total of ten Hazeltine 2000 terminals available for the exclusive use of Language Program students. We decided on the CRT-type terminals because they are quieter and allow for faster response times than do hard-copy terminals. A possible drawback in using CRTs is that students do not have ready access to paper copies of their completed lessons. However, using CRTs has the advantage of lessening the possibility of cheating.

We have tried to incorporate the use of the computer terminals into regularly scheduled class time. We believe that the spatial design of our program allows for efficient use of teacher-student contact time. For example, the teacher can be conducting a small-group discussion in the classroom area. While that is going on, other students in the adjacent area can be working at the computer terminals or at study tables. The teacher can switch students in various combinations according to their individual needs. Consequently, the teacher can make himself more available to students on an individual or small-group basis than would be possible in a conventional classroom situation. To maximize the availability of the access areas, we have scheduled student assistants to supervise terminal use during "off days." Therefore, students who have not completed computer assignments during regular class time may use the terminals at other times during the week.

Once a student has logged-on the computer, the teacher or a student assistant is always available to answer questions, to offer encouragement, and to supervise the use of the terminals. Hence, we have tried to avoid the situation of putting the student at the computer terminal and forgetting about him. Yet we have tried to avoid the other extreme as well--that of having a tutor or proctor watching over the student's shoulder as he works at the computer terminal. As B. A. Green recently stated: "Let the computer patiently and non-punishingly respond to the student's errors while he learns; then let the human proctor admire and congratulate the student's success."[1] We have tried to create a situation in which the teacher is available *if the student needs him*. The student, for example, may need to be reassured that obvious typing errors will not be counted against him. Moreover, a student may become confused or frustrated if he cannot immediately detect the specific error in his response should his response be incorrect. The immediate impulse is to blame the computer or the lesson. The teacher or proctor

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[1]B. A. Green, "Proctors or Tutors in PSI Courses?" *PSI Newsletter* (June, 1975), p. 2. PSI is the abbreviation for Personalized Systems of Instruction, The *Newsletter* is published by Georgetown University, Washington, D. C.

can minimize frustration by pointing out the error and offering encouragement should the student need it.

We feel that we have much work ahead of us in expanding our C.A.I. materials for use in the Gallaudet Language Program. Our immediate plans involve adding more lessons in much-needed areas of language instruction and adding prescriptive messages to our review lessons. We especially need C.A.I. materials which offer reading practice for our students. Moreover, we are in the process of undertaking an item analysis of questions most frequently missed by students who have used our C.A.I. lessons. Our future plans call for developing video tape-computer linkups. We hope to present language concepts bilingually (AMESLAN and Signed English) through video tapes and then provide drill and practice by means of C.A.I. We plan to create a system in which a student can access a video tape explanation of the concepts he is required to manipulate in the computer lessons. Initially, we plan to install a video play-back system in the same room as the computer terminals. If the student feels he needs to access a particular video tape, he can, by himself or through the assistance of a proctor, select the appropriate video cassette and run it on a cassette player.

Although our plans are as yet unfinished, we feel that the implementation of C.A.I. into language instruction at Gallaudet has represented a definite gain in the total instructional resources available. C.A.I. has freed the teacher from many unnecessary and time-consuming areas of instruction and has found success among students. The response of both students and language instructors has been encouraging. Indications thus far are that the C.A.I. materials equal other methods of teaching English structure; therefore, because of the time saved and student enthusiasm for C.A.I., we feel that C.A.I. can be very beneficial in the hearing impaired situation.

Included in this packet you will find the following:

1. A description of Gallaudet's Language Program
2. A student guide to computer usage
3. A list of computerized lessons
4. A sample printout of a lesson.

November 3, 1975

PROGRAM DESCRIPTIONS

We now have a three-year English Language Program at Gallaudet. This Program is based on an English as a second language format. All students entering Gallaudet College take an English Placement Exam to determine whether they enter the Language Program or go into regular Freshman English classes. The Test is given three times a year; a student can pass out of the Program in May, August, or December.

When a student enters the Language Program, he is assigned to a two-hour time block rather than an individual teacher (i.e., he can be assigned to a MWF, 8-10, a 10-12, etc. class time. Each student is in class for six hours each week and is expected to do approximately another twelve hours of outside work. Unfortunately the Program carries no credit, consequently, motivation is sometimes a problem.

The Program is designed to be self-paced, individualized and somewhat self-instructional. In practice we have two different teaching methods in operation. Some instructors, who have been assigned relatively homogenous classes of intermediate level students, use materials especially developed for that level of student. These classes use the normal classroom for explanations and drill and practice. In addition, these teachers use an interlinked TTY system for drill and practice with immediate correction and reinforcement which is teacher controlled. Other instructors, who have more heterogenous classes, use an individualized approach. They prepare each student's weekly work load based on his individual needs and progress. Their classroom space is in the same room as their offices, or nearby.

The Program incorporates four major areas of language. (We can discuss these separately, but we do not isolate the areas in actual practice.)

1. The Reading component is designed to help in all areas of reading skill (content analysis, inference, comprehension, etc.). The materials available include novels parpared as second language texts on various levels of difficulty, current news and popular magazines, specially designed magazines (such as Scope and Search) and structured materials such as the Reading for Understanding series.

2. The Vocabulary component is integral to the Reading component although we use many teacher developed materials, have some drills on the computer, and a few experimental video tapes.

3. The Structure component consists of materials designed on a second language format on the computer, in beginning and mid-level classroom texts, and in

self-instructional materials -- all specifically created here at Gallaudet. These materials are still being evaluated and further developed.

4. The Writing component consists of free writing in journals on given topics or of more controlled writing specifying particular structures to be used. For example, a teacher might ask a student to summarize an article he has read and to use only simple sentences or only the past tense.

For all of the above components, a complete record is kept of what a student has done and any comments about his work. These records allow us to move a student from teacher to teacher (if desirable) with full knowledge of his progress and needs. The spatial arrangement of the Program is based on individualized classrooms. We limited our class size to a maximum of eight students. This allowed us to have a class space in each four-person office. We also allowed for a student work area in each office. This allows for flexibility of movement plus enables us to have students working on widely different assignments at the same time and within the instructor's easy range of movement. We also included computer terminals in each office. In a typical class of seven students at any one time, three may be working at the terminals, two may be working on R.F.U.'s, one may be reading a novel, and one may be having a conference with his instructor -- all within the same room.

We have established a tutorial system which is closely linked to the Program. The basic idea is to give help to students who need language skills but are not in the regular Program. Our tutors work with students on an individual basis using materials and some techniques from the Language Program itself.